White Paper

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T66

Sony Ericsson

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Preface

Purpose of this document

The Ericsson T66 White Paper is designed to give the reader a deeper technical understanding of how the T66 is designed, and how it interacts with other media. This document will make it easier to integrate with the IT and communications solutions of a company or organization.

People who can benefit from this document include:

- Corporate buyers
- IT Professionals
- Software developers
- Support engineers
- Business decision-makers

The best place to find all the extras you need to support your phone and daily life is at the Sony Ericsson Mobile Internet, http://www.SonyEricssonMobile.com/mobileinternet. Here you will find downloadable ring tones, games, news, information, and a host of exciting links to other sites.

More information, useful for product, service and application developers, is published on the Ericsson Mobility World. This site, at http://www.ericsson.com/mobilityworld, contains up-to-date information about technologies, products and tools.

Product overview

The T66 is a an amazingly small triple band phone. It has a lithium battery and impressive talk and standby times. It is a phone of modern design and advanced technology with the most popular features. The T66 is produced only in a limited volume.

Key functions and features

Small and light

The T66 mesures 92x41x18,5 mm and weighs 59,5 grams. It is one of the smallest phones of the market.

Large display

Although small in size, the T66 has a large display: 101x65 pixels (5 rows). This gives the user maximum readability when using the calendar, WAP and while messaging.

EMS

The T66 supports limited Enhanced Messaging Service (EMS), an enhancement of the SMS standard. This makes it possible to include pictures and melodies in messages, and also to receive and edit new pictures and melodies on the phone. There are 98 pre-installed black-and-white pictures at purchase of phone.

Predictive text input

The T66 has Predictive Text Input to make messaging easier. Instead of having to press keys several times for a letter, software in your T66 anticipates what word or phrase you are writing.

Option key

The T66 keypad has an option key. By pressing this, the most common options for the function currently in use is presented to the user. The option key also provides a help menu for certain functions.

Calendar

The T66 has a stand-alone calendar, where the user easily can store important events and tasks. There are three different views to change between: Month, week and day.

WAP 1.2.1 browser

The T66 has a Wireless Application Protocol 1.2.1 compliant browser, allowing fast and reliable access to Internet services with security according to WTLS class 2. GSM data access type is supported.

Mobile chat

The T66 has a Mobile chat over SMS , providing Internet-style chat functionality.

More in-phone functions

Melody composer

The T66 has a built-in Melody Composer, where the user can edit and create up to 8 melodies by using the phone's keypad. Each melody can consist of up to 99 notes over 5 octaves. A note (or rest) can be set in one of six durations. All this gives a great flexibility in creating personal ring tones and melodies for the user.

SIM AT

The T66 supports SIM Application Toolkit (Online Services), which makes it possible for operators to provide new services to existing users over the air, including new menus and functions in the phone.

Profiles

The T66 profiles feature; groups of settings preset to suit certain environments, such as "Meeting", "Port H-free", "Home". The profiles are also related to intelligent accessories such as a portable handsfree.

Full graphic display

The T66 has a large, full graphic display with an easy to navigate, user interface software.

Shortcuts

The T66 has a number of shortcuts which make it possible to prepare settings into a favourite menu which the user can access quickly and easily.

Phone book

In a company or an organisation, you may need to deploy several phones with a common set of phone book entries. This is done in the following way:

Prepare the phone book on one SIM card in one phone. Then copy the contents from this SIM card to the SIM cards of all the other phones. Please see the User's Guide for more information.

Start-up and shutdown shows

The T66 has built-in start-up and shutdown shows that feature a short animation with a melody.

Messaging and chat

The T66 is capable of sending and receiving SMS messages, linked messages and it supports Enhanced Messaging Service (EMS). Also, mobile chat over SMS is supported.

- With the Short Message Service, a user can send text messages containing up to 160 characters to and from GSM mobile stations (up to 70 characters using Chinese text)
- With the long messages, the user can link several (3) SMS messages together to create a longer message (network-dependent service)
- With EMS, the T66 lets the user insert pictures and melodies, or ring tones, in outgoing messages. Also, the phone will display pictures and melodies included in incoming messages (network-dependent services)
- The T66 makes it possible to chat with a second party using SMS. The chat is a series of short messages and corresponding replies between two parties, similar to chat services provided on the Internet.

The T66 also lets you save often-used text messages as templates. You can save up to ten templates consisting of up to 160 characters each in the phone's memory.

Enhanced messaging service (EMS)

Enhanced Messaging Service (EMS) is powerful enhancement of the SMS standard specified by the 3rd generation Partnership Project (3GPP). It is supported by the major network operators and mobile phone manufacturers. With it, mobile phone users can add life to SMS text messages in the form of pictures and melodies. This gives the users new ways to express feelings, moods and personality in SMS messages.

As well as messaging, users can collect and swap pictures and ring signals and other melodies, downloading them from the Internet or edit them directly on the phone. See related documents listed under "Documents" on page 19. EMS is a network-dependent service.

Pictures

In the T66, there are over 90 permanently stored pictures that express different moods and situations. The pictures are grouped by eight different themes to make them easy to find. In addition, the T66 has another 30 empty

positions where the user can save pictures that have been received in incoming messages, or have been created by the user on the phone.

For easy access, the user can save shortcuts to pre-installed or edited pictures in *My Favourites*, see the User's Guide.

Melodies

Melodies received in incoming messages and composed by the user on the phone's keypad can be stored in *My Melodies*. These are easily inserted in outgoing messages, see the User's Guide. The built in tool for editing and creating melodies on the phone's keypad is the Melody Composer.

Picture editor

The user can edit pictures and symbols directly on the phone, to create new, personal pictures for inclusion in EMS messages. The Picture Editor allows the user to view the picture in the display and edit it with the pen tool.

The available tools include:

- Set line thickness
- Zoom in, zoom out
- Change picture width and height
- Select black or white pen

The T66 has a set of predefined pictures for use with EMS, which also can be edited. New pictures can be received with EMS messages and saved in the phone. See the User's Guide for a description of this function.

Mobile chat via SMS

The T66 makes it possible to chat with a second party using SMS. The chat is a series of short messages and corresponding replies between the two parties, similar to chat services provided on the Internet. This allows the user to review the conversation history in the display, and to reply by using a few commands. This makes a chat session quicker than usual SMS correspondence.

- Nicknames can be used to help identify the user in the chat.
- A user can temporarily leave a chat session, for example to use the calculator, or play a game, and then resume the chat session.
- Incoming and outgoing messages are identified with special icons in the display, and with the sender's nickname.
- Users can hide their own messages from the chat display, only viewing the chat messages from the second party.

The chat session can be saved as a history, for later review.

WAP Services

Using WAP in the T66

The typical WAP client is a small, portable device which is connected to a wireless network. This includes mobile phones, pagers, smart phones, PDAs and other small devices. In these devices, you have a limited user interface, low memory and computing power compared to desktop and laptop computers.

The WAP browser in the T66 is designed for WML. It is suitable for interaction with customer services, e.g. ticket reservation. It is also handy when you want to access text-based information, such as timetables, share prices and exchange rates and Internet banking and other interactive services.

The built in WAP browser gives the user portable, fast and secure access to a wide variety of services, with the possibility of personalized services. WAP in the T66 offers new opportunities to companies and service providers:

Bearer type

The T66 accesses WAP over a standard GSM Data connection. (Network-dependent services.)

Connection-oriented

Supporting connection-oriented WAP, the T66 provides WAP browsing with a high reliability. Connectionless WAP is also supported.

Bandwidth efficiency

One of the key advantages WAP has over text-based HTML pages on mobile devices, is the bandwidth efficiency of communication. This is due partly to the fact that the WAP application is communicated to the wireless devices in the form of binary encoded data.

Provide settings

Using SMS messages, configuration settings can be sent over the air, OTA, so that the user does not need to configure the WAP access settings manually.

The WAP profiles

The T66 holds eight WAP profiles, each with a group of network settings and a homepage. If you provide a corporate WAP service on your Intranet, it is useful to enter an Intranet WAP profile in user phones. The WAP profile holds network settings and user identification. The users switch between corporate services and WAP services on the Internet, by switching WAP profile.

Yes, gives the most common options for the function currently in use. The option key also provides a help menu for certain functions.

Yes, gives the most common options for the function currently in use. The option key also provides a help menu for certain functions.

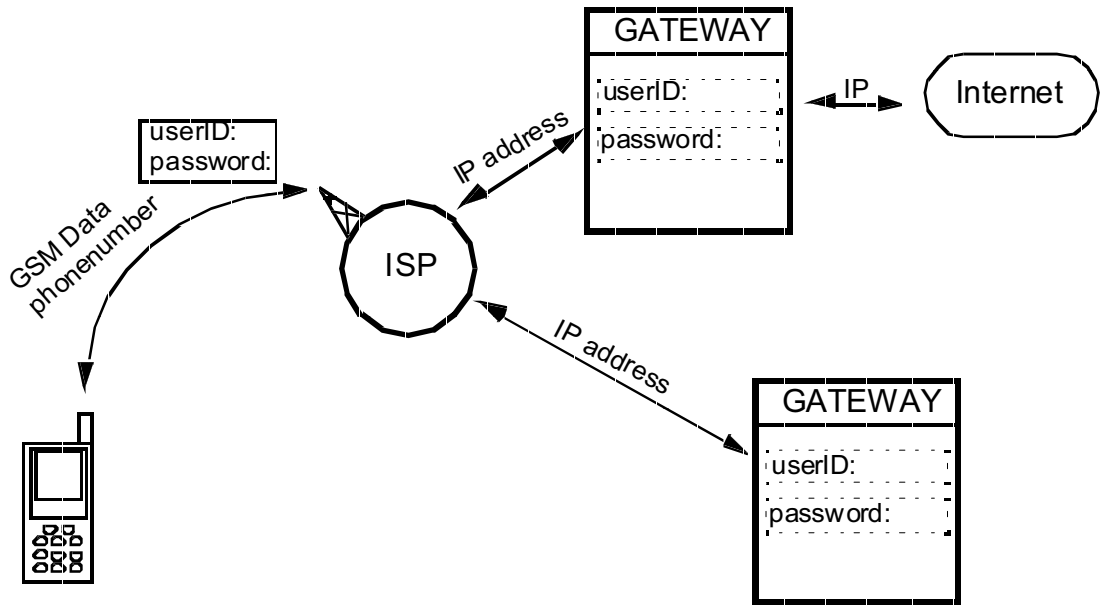
Technical specifications of the WAP browser

Feature	Support in the T66 WAP browser
Authentication	WAP 1.2.1 Server applications may request Basic Authentication. Gateway may request Authentication during connection setup.
Back to previous page	Yes
Bearer type GSMData (IP)	Yes, ISDN and analog
Bearer type SMS	No
Bookmarks	Yes, up to 8 named bookmarks for easy access to frequently visited pages
Cache	Yes
Character sets*	UTF8 (Default), USAASCII, Latin 1, UCS2
Colour	1 bit (b/w)
Homepage	Yes, up to 8 different, one for each WAP profile
Hyperlinks in Text	Yes, highlighted by inverse video
Hyperlinks in Images	Yes, indicated by a frame
Image Animation	No
Image Formats	WBMP, no transparent layers
Network Settings	Up to 8 different settings available by selecting WAP profile (Intranet, Internet, Banking, Gateway etc.)
OTA Support	Yes
PPP Authentication	PAP & CHAP
Reload page	Yes
Tables	Yes
WAP/WML	WAP 1.1 & 1.2.1 compliant, WMLScript Layers implemented: WAE, WSP, WDP, WTLS
WAP profiles	8 WAP profiles, each with its own settings

*) When creating WML applications, it is recommended always to save the page contents as UTF8, and this is clearly indicated in the pages before publishing. This ensures that the contents of the application can be viewed, regardless of character sets used in gateways and the phone. All characters are not supported in all phones. The software version depends on the market the phone is intended for. Also, please note that the phone may not support input on a WAP Service which uses certain characters (MMI languages), even if those characters are supported for browsing in the phone.

Bearer characteristics

The phone accesses WAP services over IP, where IP is provided over GSM Data.



GSM data access

- Circuit connection of data calls mean that the phone is connected during the WAP session.
- Connection-oriented WAP uses error recovery services to provide high reliability.
- Higher transmission speed than with SMS access.
- Pricing of GSM data access comparable to that of data calls in the network.
- Suitable for Complex Pull services, Browsing and Data transfer.
- Not suitable for Provisioning, Pager service.
- Connectionless WAP can also be used for those networks that do not support connection-oriented WAP.

Connection-orientated WAP

The T66 supports connection-oriented WAP over GSM Data. In general, this means that the connection between the WAP browser in the phone and the WAP Gateway is maintained in a session with error recovery services. This gives a high reliability with a reduced risk of errors in the transmission, and improves efficiency in WAP browsing.

Security using WAP

The T66 is based on the WAP 1.2.1 specifications where security functionality is specified with a technology called Wireless Transport Layer Security (WTLS).

The WAP protocols that handle the connection, its transport and its security are structured in protocol layers. The security is handled by the WTLS layer operating above the transport protocol layer. The WTLS layer is modular and there are WTLS classes that indicate which security level is supported by the application.

- WTLS class 1 specifies an encoding of the information.
- WTLS class 2 includes class 1 and in addition a server authentication, where server certificates are needed in the phone (access lock)

The T66 supports WTLS class 2.

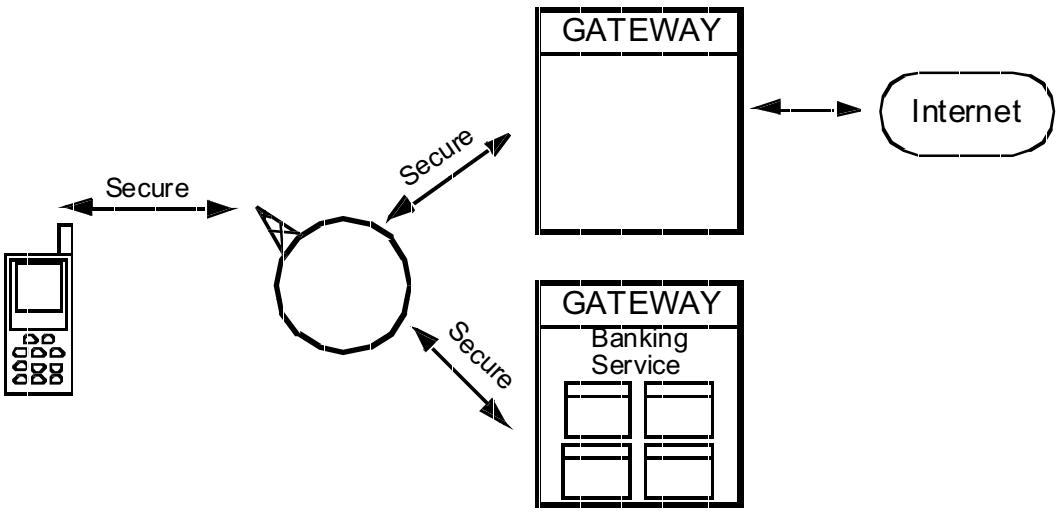


Figure 1. Example showing the limitations of security implementation.

Over The Air provisioning of WAP settings

To simplify configuring WAP setting in a number of phones, all settings can be sent as an SMS message to each phone. This makes it easy for an operator, a service provider or a company to distribute settings for Internet/Intranet, and WAP, without having to configure each phone manually. This also makes it easy to upgrade the services provided to the users, without the need for users to perform any manual configuration.

- The OTA configuration message is distributed via SMS point-to-point.
- The setup information is a binary encoded XML message. To receive information about OTA specifications, please contact your local Sony Ericsson representative for consumer products.
- The user is not alerted about new settings until the ongoing browsing session ends. Futhermore, settings are not charged during an ongoing browsing session.
- The necessary user interaction is limited to receiving and accepting/rejecting the configuration message, and selecting which WAP profile to allocate the settings to.
- Security can be handled using a keyword identifier displayed on the screen as a shared secret between the SMS sender and the receiver. It is important that the user has a way to verify that the configuration message is authentic.

Configuration of WAP settings

To perform the WAP configuration of a single phone it is suggested to use the functions and information provided on the Sony Ericsson Internet. This is available on http://SonyEricssonMobile.com/mobileinternet.

A manual configuration is made using the menu system in the phone. This is described in the User's Guide.

In-phone functions and features

**Subscription and/or network-dependent*

In-phone functions and features		
A	Alarm clock with snooze function	Yes
	Alphabet input (Arabic, Chinese, Cyrillic, Greek and Hebrew)	Yes
	Antenna connector, external for HF kits	No
	Automatic redialling	Yes
B	Background light	Yes
	Bluetooth wireless technology support	No
	Bookmarks (URL memory)	Yes
	Built-in antenna	Yes
C	Calculator	Yes
	Calendar	Yes
	Call barring*	Yes
	Call divert*	Yes
	Call forwarding*	Yes
	Call hold*	Yes
	Call list (last dialled, answered and missed calls)	Yes
	Call screening*	Yes
	Call time/call cost (a.k.a Advice of Charge, Information/ Charging)*	Yes
	Call transfer*	Yes
	Call wait	Yes
	Calling card service	Yes
	Calling Line Identification (CLI)	Yes, as the number of the caller.
	Chinese text input	Yes (Stroke, Pinyin and Bopomofo)
	Clock	Yes, with Time Zone*
	Closed User Groups (CUG)*	Yes
	Code memo	Yes
	Conference calls*	Yes
	Contacts	No

In-phone functions and features		
D	Date	Yes
	Display light	Yes
E	EDGE (enhanced Data rates for Global Evolution)*	No
	e-GSM	Yes
	EMS (Enhanced Messaging Service)*	Yes
	External antenna connector	No
F	Fixed Dialling Numbers (FDN)*	Yes
G	Games	Yes, 3 games
	GPRS (General Packet Radio Services)*	No
	GSM	Yes, 900/1800/1900, phase 2+
H	Help texts	Yes
I	Infrared port	No
	Input methods	T9 Text Input, multitap alphabetic (GSM standard), T9 Text Input, Bopomofo, Pinyin and Stroke
	International roaming	Yes
K	Keypad lock	Yes
L	Language selection	Yes
M	Mobile chat	Yes
	Modem	No
O	Option key	Yes, gives the most common options for the function currently in use. The option key also provides a help menu for certain functions.
P	Phone book	Yes
	Phone lock	Yes
	Picture editor	Yes, stand-alone picture editor facility. Here the user can create new and edit existing pictures (WBMP).
	Pictures, downloadable	Yes, limited only by memory
	Pictures, exchange	Yes, via EMS
	Predictive text input	Yes

In-phone functions and features		
	Profiles	Yes
R	Re-dialling, automatic	Yes
	Ring signal composer	Yes
	Ring signal exchange	Yes, via EMS
S	Shortcuts	Yes
	SIM Application Toolkit*	Yes
	SIM card copy	Yes
	SIM card lock	Yes
	Sleep mode	No
	SMS (Short Message Service)*	Yes
	SMS Cell Broadcast*	Yes
	SMS counter	Yes
	SMS templates	Yes
	Sound handling	Yes
	Speaker phone	No
	Speech coding	Enhanced, Full and Half Rate
	Speed dialling	Yes
	Start-up/Shutdown shows	Yes
	Status menu	Yes
	Stopwatch	Yes
	Swatch Internet Time	No
	Synchronization with PC	No
	SyncML	No
T	Timer	Yes
	Two Line Service (a.k.a Alternate Line Service, ALS)	No
V	Vibrating alert	Yes
	Voice mail	Yes
W	WAP browser	Yes, WAP 1.2.1 browser
	WTLS for added WAP security*	Yes, WTLS class 1 and 2

Network dependent features

SMS messaging

The T66 is capable of sending and receiving SMS messages.

- With the Short Message Service, a user can send text message containing up to 160 characters to and from GSM mobile stations.

A Service Centre (SC) acts as a storage and forwarding centre.

SMS consists of two basic services:

- Mobile Orientated SMS (from a mobile station to an SMS-C)
- Mobile Terminated SMS (from an SMS-C to a mobile station)

For Mobile Originated SMS, an SMS message is sent from a Mobile Station to the SMS-C where it is forwarded to its destination. This can be another Mobile Station, or a terminal in the fixed network.

A Mobile Terminated SMS is when an SMS message is forwarded from the SMS-C to a Mobile Station. When the Mobile Station receives the message, it returns a delivery report saying the transfer was successful.

Fixed dialling and restricted calls

For a company or an organisation, it can be useful to restrict phone calls. Fixed dialling involves presetting a number of digits, for example area codes. This restricts the user to making calls only to numbers which use the preset digits as leading digits. Fixed Dialling makes use of the PIN2, and it requires fixed dial fields on the SIM Card.

Restricted calls allows outgoing or incoming calls in certain situations, for example international calls to be blocked

SIM Application Toolkit

The SIM Application Toolkit (SIM AT) is a smartcard-centric method of deploying programs that apply only to GSM and to SMS and USSD transports. Programs must be distributed on smartcards. WAP is an Internet-centric method of deploying programs that is independent of network technology. Programs and content are kept centrally on web servers and downloaded as required.

While there is some overlap, WAP is a particularly good choice when deploying programs that also have an HTML version for desktop use. Work is currently underway on building interfaces between the two technologies.

For an operator, a company or service provider, SIM AT offers a powerful way to develop programs and services to users, without the need for new or upgraded equipment. All necessary setup and programming is distributed to the users over the air, directly to their phones. In the T66, a separate menu is available, and there are also functions which allow the phone to initiate calls, send data and display information for the user.

SIM AT services supported by the T66

Service	Mode		Support in T66
CELL BROADCAST DOWNLOAD			Yes
DISPLAY TEXT	bit 1:	0 = normal priority	Yes
		1 = high priority	Yes
	bit 8:	0 = clear message after a delay	Yes
		1 = wait for user to clear message	Yes
GET INKEY	General: The GET_INKEY requires that the user press “Yes” to confirm his/her choice		Yes
	bit 1:	0 = digits (0-9,*,# and +) only	Yes
		1 = alphabet set	Yes
	bit 2:	0 = SMS default alphabet	Yes
		1 = UCS2 alphabet	Yes
	bit 3:	0 = character sets defined by bit 1 and bit 2 are enabled.	No
		1 = character sets defined by bit 1 and bit 2 are disabled and the “Yes/No” response is requested.	No

Service	Mode		Support in T66
GET INPUT	General: No limit of hidden input characters		Yes
	bit 1:	0 = digits (0-9,*,# and +) only	Yes
		1 = alphabet set	Yes
	bit 2:	0 = SMS default alphabet	Yes
		1 = UCS2 alphabet	Yes
	bit 3:	0 = ME may echo user input on the display	Yes
		1 = user input not to be revealed in any way (see note)	Yes
	bit 4:	0 = user input to be in unpacked format	Yes
		1 = user input to be in SMS packed format	Yes
	bit 8:	0 = no help information available	Yes
		1 = help information available	Yes
MORE TIME			Yes
PLAY TONE			Yes
POLLING OFF			Yes
POLL INTERVAL			Yes
PROVIDE LOCAL INFORMATION	‘00’ = Location Information (MCC, MNC, LAC and Cell Identity)		Yes
	‘01’ = IMEI of the ME		Yes
	‘02’ = Network Measurement results		No
	‘03’ = Date, time and time zone $(DTTinPLI)$		No
REFRESH	General: The reset option requests the user to turn off and turn on the mobile.		No
	‘00’ = SIM Initialization and Full File Change Notification;		Yes
	‘01’ = File Change Notification;		Yes
	‘02’ = SIM Initialization and Full File Change Notification;		Yes
	‘03’ = SIM Initialization;		Yes
	‘04’ = SIM Reset;		Yes
SELECT ITEM			Yes
SEND SHORT MESSAGE	bit 1:	0 = packing not required	Yes
		1 = SMS packing by the ME required	Yes
SEND SS			Yes

Service	Mode	Support in T66
SET UP CALL	General: Capability configuration	Yes
	Setup speech call CallParty Subaddress	No
	DTMF support	Yes
	'00' = set up call, but only if not currently busy on another call;	Yes
	'01' = set up call, but only if not currently busy on another call, with redial;	Yes
	'02' = set up call, putting all other calls (if any) on hold;	Yes
	'03' = set up call, putting all other calls (if any) on hold, with redial;	Yes
	'04' = set up call, disconnecting all other calls (if any);	Yes
	'05' = set up call, disconnecting all other calls (if any), with redial;	Yes
SET UP MENU		Yes
SMS PP DOWNLOAD		Yes

User interaction with SIM AT

DISPLAY TEXT

A text string of up to 70 characters (80 UCS coded) is supported.

Text clearing times

- 10-20 seconds. 60-second timeout limit for the user to clear the text.

'Key' responses'

- Long NO' - Proactive session terminated by user.
- 'NO' - Backward move in proactive session. Any other key clears display if the command is performed successfully.

GET INKEY

Prompt for a one character input. Pressing 'YES' without entering a character gives warning message "Minimum 1 character".

'Key' responses'

- CLR' clears current character.
- 'Long NO' terminates the proactive session.
- 'NO' - Backward move in proactive session.
- 'YES' - Comman performed successfully.

GET INPUT

Prompt for character input. Pressing 'YES' without entering a character gives warning message "Minimum 'no' characters". The phone will refuse to accept further input when maximum response length is exceeded.

MMI Maximum Response lengths

- Digits only XXXXX characters.
- SMS default alphabet characters - 160 characters.

'Key' responses'

- CLR' clears current character/characters.
- 'Long NO' terminates the proactive session.
- 'NO' - Backward move in proactive session.
- 'YES' - Command performed successfully.

SELECT ITEM

Scroll to highlight item in selection. The maximum number of items supported by the phone within one Select Item command, is 30.

'Key' responses

- Down arrow – Scroll down list.
- Up arrow – Scroll up list.
- 'Long NO' terminates the proactive session.
- 'NO' - Backward move in proactive session.
- 'YES' - Command performed successfully.

SEND SHORT MESSAGE

Default message "Sending message Please wait" can be replaced for the Alpha Identifier text, or suppressed completely if a null text is provided. Responses are "MESSAGE FAILED" or "MESSAGE SENT".

'Key' responses'

- Long NO' or 'NO' terminates the proactive sesion.

SET UP CALL

If the ME is on a call when the command 'Set up Call, putting all other calls on hold' is sent, the user will see the text 'Setting up a call current call will be held'. If the 'YES' key is pressed the current call will be put on hold and the new call set up. If the ME is on a call when the command 'Set Up Call, disconnecting all other calls' is sent, the user will see the text 'Setting up a call current call will be disconnected'. If the 'YES' key is pressed the current call will be disconnected and the new call set up.

SET UP MENU

Incorporates a SIM Application Toolkit Menu Item into the ME's main menu structure. From the standby display, the right or left arrow buttons can be pressed to select the Menu Items. (Note: The SIM AT menu option is found in the 'Extras* menu).

If Alpha Identifier is supplied in the Set Up Menu command, this is used as the SIM AT entry in the ME's main menu. If no alpha identifier is supplied and only one item provided, then this item is used as header. If no alpha identifier is supplied and several items are found in the menu, a default title is used. If the SIM AT Menu Item is selected using the 'YES' key, all the items sent in the Set Up Menu command will be available for selection, in the same way as the Select Item command. A limit of 30 menu items has been set within this command.

'Key' responses

- Down arrow - Scroll down list.
- Up arrow - Scroll up list.
- Side key: - Scrolls the menu.
- 'YES' - Envelope (Menu Selection).

Terminology

API

Application Programming Interface.

Bearer

The method for accessing WAP from the phone, for example GSM Data (CSD) and SMS.

bFTP

binary File Transfer Protocol.

Bookmark

A URL and header/title stored in the phone.

Browsing session

The period from the first access of content until the termination of the connection.

Calling Line Identification (CLI)

Shows the number of the caller, or a picture assigned to the number of the caller in the mobile phone display. Not all numbers can be displayed. Network-dependent feature.

Card

A single WML unit of navigation and user interface. May contain information to present to the user, instructions for gathering user input, etc.

CGI

Common Gateway Interface. Server technology that generates web pages dynamically.

CS

Circuit Switched.

CSD

Circuit Switched Data.

Deck

A collection of WML cards.

DTMF or Touch Tone

Dual Tone Multi-Frequency signal – codes sent as tone signals. Used for telephone banking, accessing an answering machine, etc.

e-GSM

Extended GSM. New frequencies specified by the European Radio Communications Committee (ERC) for GSM use when additional spectrum is needed (Network-dependent). It allows operators to transmit and receive

just outside GSM's core 900 frequency band. This extension gives increased network capability.

EFR
Enhanced Full Rate, speech coding.

EMS
Enhanced Message Service. Allows the user to add simple pixel pictures and animations, sounds and melodies to a text message. The EMS 3GPP standard also includes text formatting.

ETSI
European Telecommunications Standards Institute.

FR
Full Rate, speech coding.

Gateway
A WAP Gateway typically includes the following functions:

- A Protocol Gateway – the protocol gateway translates requests from the WAP protocol stack to the WWW protocol stack (HTTP and TCP/IP).
- Content Encoders and Decoders – the content encoders translate Web content into compact encoded formats to reduce the size and number of packets travelling over the wireless data network.

GSM
Global System for Mobile Communications. GSM is the world's most widely-used digital mobile phone system, now operating in over 100 countries around the world, particularly in Europe and Asia-Pacific.

GSM 900
The GSM system family includes GSM 900, GSM 1800 and GSM 1900. There are different phases of roll-out for the GSM system and GSM phones are either phase 1 or phase 2 compliant.

GSM 1800
Also known as DCS 1800 or PCN, this is a digital network working on a frequency of 1800 MHz. It is used in Europe and Asia-Pacific.

GSM 1900
This is a digital network working on a frequency of 1900 MHz. It is used in North America.

HDML
Handheld Device Markup Language.

HDTP
Handheld Device Transport Protocol.

HR
Half Rate, speech coding.

HTML
HyperText Markup Language.

HTTP
HyperText Transfer Protocol.

Image
WBMP or GIF image contained in a Card.

IRC
Internet Relay Chat.

ISP
Internet Service Provider.

ITTP
Intelligent Terminal Transfer Protocol.

LED
Light Emitting Diode.

LAN
Local Area Network.

ME
Mobile Equipment.

Micro browser
Accesses and displays the Internet content in a mobile phone, using small file sizes and the bandwidth of the wireless-handheld network.

MMI
Man-Machine Interface.

MS
Mobile Station.

MT
Mobile Termination.

OTA
Over-the Air Configuration. To provide settings for the phone by way of sending an SMS message over the network to the phone. This reduces the need for the user to configure the phone manually.

PDA
Personal Digital Assistant.

Phone book
A memory in the mobile phone or SIM card where phone numbers can be stored and accessed by name or position.

PIM
Personal Information Management.

SC
Service Centre (for SMS).

Service provider
A company that provides services and subscriptions to mobile phone users.

SL
Service Loading.

SIM card
Subscriber Identity Module card – a card that must be inserted in any GSM-based mobile phone. It contains subscriber details, security information and memory for a personal directory of numbers. The card can be a small plug-in type or credit card-sized, but both types have the same functions. The T66 uses the small plug-in card.

SMS
Short Message Service. Allows messages of up to 160 characters to be sent and received via the network operator's message centre to a mobile phone.

SS
Supplementary Services.

SyncML
An open standard for synchronization of all devices and applications over any network.

TCP/IP
Transmission Control Protocol/Internet Protocol.

TE
Terminal Equipment.

TLS
Transport Layer Security.

URL
Uniform Resource Locator.

USSD
Unstructured Supplementary Services Data.

VAD
Voice Activated Dialling.

VAS
Value Added Service.

WAE
Wireless Application Environment.

WAN
Wide Area Network.

WAP
Wireless Application Protocol. Handheld devices, low bandwidth, binary coded, a deck/card metaphor to specify a service. A card is typically a unit of interaction with the user, that is, either presentation of information or request for information from the user. A collection of cards is called a deck, which usually constitutes a service.

WAP Application
A collection of WML cards, with the new context attribute set in the entry card.

WAP service
A WML application residing on a web site.

WBMP
WAP Bitmap.

WDP
Wireless Datagram Protocol.

WML
Wireless Markup Language. A markup language used for authoring services, fulfilling the same purpose as HyperText Markup Language (HTML) does on the World Wide Web (WWW). In contrast to HTML, WML is designed to fit small handheld devices.

WMLScript
WMLScript can be used to enhance the functionality of a service, just as, for example, JavaScript may be utilized in HTML. It makes it possible to add procedural logic and computational functions to WAP-based services.

WSP
Wireless Session Protocol.

WTLS
Wireless Transport Layer Security.

WWW
World Wide Web.

XML
Extensible Markup Language.

Related information

Documents

- The T66 User's Guide
- WAP 1.2.1 Specification
- iMelody specifications are found in "Infrared Data Association; Specifications for Ir Mobile Communications (IrMC); iMelody (October 2000)" (Note that only a subset of the standard is supported)
- Enhanced Messaging Service White Paper Developers' Guidelines for EMS

Links

- http://SonyEricsson.com/mobileinternet - a site for updates on Ericsson products and technologies
- http://www.ericsson.com/mobilityworld - information, tools, whitepapers and software updates on Ericsson products and technologies
- http://www.irda.org - home of the Infrared Data Association
- http://www.etsi.org - home of the European Telecommunications Standards Institute
- http://www.wapforum.org - home of the WAP Forum

Trademarks and acknowledgements

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Technical specifications

The consumer pack includes:

- 1 Mobile Phone T66
- 1 Standard Battery BSL 14 (570 mAh)
- 1 Travel Charger CTR-10
- 1 Ericsson service and support leaflet
- 1 SAR leaflet
- 1 User's guide
- Portable Handsfree with answering button, HPB-10

General

Product Name	T66m/T66mc
System	GSM phase 2 recommendations. GSM 900, GSM 1800, GSM1900, e-GSM supported
Speech Coding:	HR, FR, EFR supported where available, for high speech quality
SIM card	Small plug-in card, 3V type
Type number, T66m	1130401 -BV
Type number, T66mc	1130401 -CN

Exterior description

Size	91.7 x 41.0 x 18.5 mm
Weight	with standard battery approx. 59g
Display size	101 pixels wide, 65 pixels high
Graphic display	black and white
Text rows	up to 5 rows of text
Colours	Purple Passion, Silver Supreme
Keypad	18 keys and a slider on the side

Ambient Temperatures

Operating	Max: +55°C, Min +5°C
Storage	Max: +60°C, Min -20°C
Charging	Max: +45°C, Min 0°C

Supported Man-Machine Interface (MMI) Languages

Depending on software in the phone, these languages are supported:

Arabic (AR), Bulgarian (BG), Czech (CS), Chinese Hong Kong traditional (ZH), Chinese simplified (ZS), Chinese Taiwan (ZT), Croatian (HR), Danish (DA), Dutch

(NL), English (EN), Estonian (ET), Finnish (FI), French (FR), German (DE), Greek (EL), Hebrew (HE), Hungarian (HU), Indonesian (ID), Italian (IT), Latvian (LV), Lithuanian (LT), Malay (MS), Norwegian (NO), Philippine-Tagalog (TL), Polish (PL), Portuguese (PT), Romanian (RO), Russian (RU), Serbian (SR), Slovakian (SK), Slovenian (SL), Spanish (ES), Swedish (SV), Turkish (TR)

*) *Some languages may not be available at launch.*

Performance and technical characteristics

Dimension	GSM 900/ E-GSM 900	GSM1800	GSM1900
Frequency range	TX: 880 - 915 MHz RX: 925 - 960 MHz	TX: 1710 - 1785 MHz RX: 1805 - 1880 MHz	TX: 1850 - 1910 MHz RX: 1930 - 1990 MHz
Channel spacing	200 kHz	200 kHz	200 kHz
Number of Channels	174 Carriers*8 (TDMA)	374 Carriers*8 (TDMA)	299 Carriers*8 (TDMA)
Modulation	GMSK	GMSK	GMSK
TX Phase Accuracy	<5° RMS Phase error (burst)	<5° RMS Phase error (burst)	<5° RMS Phase error (burst)
Duplex spacing	45 MHz	95 MHz	95 MHz
Frequency stability	+/- 5 ppm (downlink RX)	+/- 175 Hz (downlink RX)	+/- 175 Hz (downlink RX)
Voltage operation (nominal)	3.6 Volts	3.6 Volts	3.6 Volts
Transmission current average	295 mA (max) 100 mA (min)	210 mA (max) 95 mA (min)	210 mA (max) 95 mA (min)
Talk time	1.5 to 5 hours	2.5 to 5 hours	2.5 to 5 hours

Dimension	GSM 900/ E-GSM 900	GSM1800	GSM1900
Standby current average	2.7 mA (min), paging rate 9, 1 neighbour present 3.5 mA (typ), paging rate 5, 8 neighbours present 6.1 mA (max), paging rate 2, 16 neighbours present	2.7 mA (min), paging rate 9, 1 neighbour present)	2.7 mA (min), paging rate 9, 1 neighbour present)
Standby time	80 - 150 hours		
Transmitter RF power output	32 dBm Class 4 (2W peak)	30 dBm Class 1 (1W peak)	30 dBm Class 1 (1W peak)
Transmitter Output impedance	50Ω	50Ω	50Ω
Transmitter Spurious emission	<-36 dBm up to 1 GHz <-30 dBm over 1 GHz (according to GSM spec.)	<-30 dBm (according to GSM spec.)	<-30 dBm (according to GSM spec.)
Receiver RF level	Better than - 102 dBm	Better than - 102 dBm	Better than - 102 dBm
Receiver RX Bit error rate	< 2%	< 2%	< 2%
*) No DTX activated			

Speech coding

Dimension	Full rate	Enhanced full rate
Type	RPE/LPC with LTP	ACELP
Bit rate	13 Kbp/s	13 Kbp/s
Frame duration	20 ms	20 ms
Block length	260 bits	244 bits
Class 1 bits	182 bits	
Class 2 bits	78 bits	

Enhanced Messaging Service technical data

EMS Feature	Support in T66		
Concatenation (linked SMS)	Yes, 3 parts, each message up to 134 bytes of data		
iMelody format support	Note range:	From octave 3 note c to octave 7 note b (Notes out of range are discarded)	
	Flat note:	Yes, &	
	Sharp note:	Yes, #	
	Rest:	Yes, r	
	Beat:	Yes,	
	Style:	Yes, (S)	
	Volume modifiers:	Yes, (V+,V-)	
	Volume:	Yes, (V)	
	Duration Specifier:	Yes, (. : ;)	
	Led:	No	
	Vibe:	Yes	
	Backlight:	No	
	Repeat:	Yes	
Include melody in message	Yes, according to iMelody v1.2 format		
Include picture in message	Yes		
Melody composer	Yes, up to 8 user defined melodies and ring tones in My Melodies, each melody up to 99 notes long. Six note durations available.		
Picture editor	Yes, edit My Pictures in the display using black or white pen, line thickness, zoom in, zoom out, picture size.		
Picture, pre-defined sizes	Originated on phone (WxH in pixels):		16x16, 32x32
	Received to phone (WxH in pixels):		Small: 8x8, Medium: 16x16, Large: 32x32
Picture, variable sizes	Originated on phone (WxH in pixels):		
	Received to phone:	Width in pixels: (Pictures wider than display are truncated.)	In multiples of 8 pixels up to the screen width (i.e.8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96)
		Height in pixels:	from 1 to 128
	Note: The total product of Width and Height must never exceed 128 bytes.		
Play melody on focus	Yes		
Pre-defined pictures	Yes, grouped by themes		
Text templates	Yes		

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